

PATENT

Atty Docket: 1403-16 PCT (OPP 061224)

AMENDMENTS TO THE SPECIFICATION

Please add the following new paragraphs after the last paragraph on page 7 in the “Summary of the Invention” Section:

-- The present invention also provides a method for receiving an Automatic Repeat reQuest (ARQ) block that includes if an ARQ block is received, determining if a block sequence number of the ARQ block is in a range of a receipt window; if the block sequence number of the ARQ block is in the range of the receipt window, determining if the ARQ block is a duplicate of a previously received ARQ block; if the ARQ block is not a duplicate and the block sequence number of the ARQ block is not less than a highest block sequence number of received ARQ blocks, updating the highest block sequence number of received blocks to a next greater value than the block sequence number of the ARQ block; and if the ARQ block is not a duplicate and the block sequence number of the ARQ block is equal to a start block sequence number of the receipt window, updating the start block sequence number of the receipt window to a next greater value than the block sequence number of the ARQ block.

The present invention also provides a computer-readable medium that stores instructions executable by at least one processor to perform a method that includes if an ARQ block is received, determining if a block sequence number of the ARQ block is in a range of a receipt window; if the block sequence number of the ARQ block is in the range of the receipt window, determining if the ARQ block is a duplicate of a previously received ARQ block; if the ARQ block is not a duplicate and the block sequence number of the ARQ block is not less than a highest block sequence number of received blocks, updating the highest block sequence number of received blocks to a next greater value than the block sequence number of the ARQ block; and if the ARQ block is not a duplicate and the block sequence number of the ARQ block is equal to a start block sequence number of the receipt window, updating the start block sequence number of the receipt window to a next greater value than the block sequence number of the ARQ block.

The present invention also provides a method for a transmitter to retransmit a packet to a receiver that includes if a transmitter does not receive an acknowledgment message for a packet transmitted to the receiver, setting a retransmission timeout; if the retransmission timeout expires,

retransmitting the packet; if a maximum management time expires, transmitting a discard message for the packet to the receiver and transiting to a discarded state; and if the transmitter receives, in the discarded state, the acknowledgment message for the packet or an acknowledgment message for the discard message, discarding the packet from a transmitting buffer.

The present invention also provides a computer-readable medium that stores instructions executable by at least one processor to perform a method that includes if a transmitter does not receive an acknowledgment message for a packet transmitted to a receiver, setting a retransmission timeout; retransmitting the packet if the retransmission timeout expires; if a maximum management time expires, transmitting a discard message for the packet to the receiver and transiting to a discarded state; and if the transmitter receives, in the discarded state, an acknowledgment message for the packet or an acknowledgment message for the discard message, discarding the packet from a transmitting buffer.

The present invention also provides a method for a transmitter to retransmit an Automatic Repeat reQuest (ARQ) block to a receiver that includes if the transmitter transmits the ARQ block to the receiver in a not-sent state of the ARQ block, transiting a state of the ARQ block to an outstanding state; if the transmitter does not receive an acknowledgment message for the ARQ block for a timeout in the outstanding state, or if the transmitter receives a non-acknowledgment message for the ARQ block in the outstanding state, transiting the state of the ARQ block to a retransmission-waiting state; if the transmitter retransmits the ARQ block to the receiver in the retransmission-waiting state, transiting the state of the ARQ block to the outstanding state; if a lifetime of the ARQ block expires in the outstanding state, transiting the state of the ARQ block to a discarded state; and if the transmitter receives, in the discarded state, an acknowledgment message for the ARQ block or an acknowledgment message for a discard message for the ARQ block, transiting the state of the ARQ block to a done state.

The present invention also provides a method for a transmitter to retransmit an automatic repeat request (ARQ) block to a receiver that includes if the transmitter transmits the ARQ block to the receiver in a not-sent state of the ARQ block, transiting a state of the ARQ block to an outstanding state; if the transmitter does not receive an acknowledgment message for the ARQ block for a timeout in the outstanding state, transiting the state of the ARQ block to a retry-timeout state; if the transmitter receives a non-acknowledgment message for the ARQ block in the outstanding state,

transiting the state of the ARQ block to a non-acknowledged state; if the transmitter receives a non-acknowledgment message for the ARQ block in the retry-timeout state, transiting the state of the ARQ block to the non-acknowledged state; if the transmitter retransmits the ARQ block to the receiver in the retry-timeout state, transiting the state of the ARQ block to the outstanding state; if the transmitter retransmits the ARQ block to the receiver in the non-acknowledged state, transiting the state of the ARQ block to the outstanding state; if a lifetime of the ARQ block expires in the outstanding state, transiting the state of the ARQ block to the discarded state; and if the transmitter receives, in the discarded state, an acknowledgment message for the ARQ block or an acknowledgment message for a discard message for the ARQ block, transiting the state of the ARQ block to a done state. --